"DRAFT"

Phase I Expanded Site Inspection
Sampling Plan
for
Hoffman Landfill

Allegany County, Maryland

(MD-4)

October 1993

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1.0 Introduction

This proposal is submitted to the United States Environmental Protection Agency (USEPA) by the Maryland Department of the Environment, Waste Management Administration (MDE/WAS) as part of an Expanded Site Inspection (ESI) of the Hoffman Landfill (MD-4). This ESI is completed under Cooperative Agreement #V-993-122-01. Additional sampling is needed to further characterize the site.

2.0 Site Description

The Hoffman Landfill is located near Frostburg in Allegany County, Maryland. The site itself is an abandoned coal strip mine (dates of operation unknown) which was converted into a sanitary landfill in 1967. The site was one of two strip mines which were converted into sanitary landfills as part of a demonstration project. The purpose of this project was to determine the effectiveness of converting strip mines into sanitary landfills. The landfill demonstration project was partially financed by the U.S. Public Health Services.[1]

The area beneath the Hoffman Landfill is underlain by coal seams (Mongahela formation). In addition, there are numerous subsurface shafts which are drained by the Hoffman Drainage Tunnel.

The Hoffman landfill operated from 1967 to late 1971. Because of the experimental nature of the landfill, many precautions and monitoring systems were in place through out the operation of the landfill. These precautions included:[1]

1) laying a three foot bed of compacted earth (from spoil piles) at the base of the landfill to slow infiltration of leachate into groundwater.

2) installation of 13 monitoring wells (3 on the waste pile, and ten just to the west of the waste pile). These were installed so the groundwater could be constantly evaluated.

3) a boron tracer substance was deposited into the landfill.

The pit which was filled with waste was approximately 1,900 ft long, 50 ft. wide at the bottom, 110 ft. wide at the top, and varied in depth from 30-50 feet. The fill capacity was about 250,000 yd^3. In addition, during the initial period of operation, a smaller 3,000 yd^3 pit was also filled.

The Hoffman landfill accepted waste from 1967 until 1971. The waste disposed consisted of municipal waste, garbage, refuse, and sewage sludge.[5] It was estimated that approximately 225,000

tons of refuse was disposed at this facility during its operation. The amount of waste disposed increased annually during the operation. In 1967, it was estimated that between 20-60 tons/day were disposed into this landfill. By 1971, this quantity had increased to between 200-275 tons/day.[1]

During the third year of operation, it was decided that the landfill should begin to accept large quantities of industrial waste. This was done to determine whether industrial wastes could be disposed of without adversely affecting the efficiency of the landfill.[1]

In addition, to Allegany County which used the landfill for much of the private waste disposal in the area, the following industries also disposed of waste at the Hoffman landfill: Hercules Corporation, Celanese Corporation, Kelly Springfield Tire, and PPS Industries.[5]

During the sanitary landfill operation at the Hoffman Landfill, it was the policy of the operators to not accept hazardous waste. It should be noted though, that no clear definition of what constituted a hazardous waste was given. The only reference which could be found discussing the type of waste that may have been disposed, referred to Carbon Black from the Kelly Springfield Tire company. According to records, the Carbon Black was disposed in 50 gallon card-board drums. According to records, " when containers of the material were punctured by the dozer, extremely fine, wind-borne particles tended to clog the nose and ears of the operator."[1] In order to solve this problem delivery of carbon black were scheduled for early in the morning, and a small depressions was dug and the drums were deposited manually into the depression. Finally, they were covered with a 6 inch layer of earth. Appendix B contains fact sheets on carbon black.

The methods used in operating this demonstration project were similar to those employed in sanitary landfill operations at that time. Specifically, six inches of cover material was distributed daily, and a final cover of 3-5 feet was added. The cover is described as strip mine overburden and spoil made up of mostly shale and shale-clay-sand fill.[5]

2.1 Previous Sampling

Regional sampling was conducted by the Department of Natural Resources, Maryland Geological Survey, in 1970. The purpose of this sampling was to "test the idea that there is a definitive relation between the chemical properties of mine drainage and the associated coal-measure stratigraphy."[2] The Hoffman drainage tunnel which drains the Hoffman landfill, was one of the sites

chosen for sampling. The results of this sampling are listed in Appendix A.[2]

In addition, to the regional sampling that was conducted, sampling specific to activities at the Hoffman Landfill was completed by the Maryland Department of Health and Mental Hygiene (MDHMH) prior to the opening of the facility and continuing through 1971. Samples were collected from Braddock Run and the on-site pond. These samples were analyzed for the following parameters: iron, chloride, nitrate, total solids, hardness, and pH.[3]

The sample results gave no indication that Braddock Run was being degraded as a result of leachate from the landfill (see Table 5A below). The authors noted that dilution as possible contaminants enter Braddock Run may affect the results and therefore make degradation of Braddock Run as a result of the landfill harder to detect.

The results from the on-site pond indicated that the iron content of the water had increased, chlorides had increased approximately 30 times, and total solids had also increased (see Table 5B below).

Table 5A: Results from Maryland Department of Health's sampling of Braddock Run.

Constituent or property	Sample collected 1-15-68 (mg/l except pH)	Sample collected 4-18-70 (mg/l except pH)	Range in values during period covered (mg/l except pH)	Number of analyses in range
Iron	9.0	9.0	0.0 - 12	11
Chloride	2.5	1.5	2.5 - 208	11
Nitrate	1.9	0.1	0.04 - 1.9	11
Total Solids	754	1040	684 - 1040	10
Hardness as $CaCO_3$	438	569	399 - 569	11
pH	6.1	6.8	3.7 - 6.8	11

Table 5B: Results from Maryland Department of Health's sampling of water from on-site pond.

Constituent or property	Sample collected 3-16-67 (mg/l except pH)	Sample collected 4-27-70 (mg/l except pH)	Range in values during period covered (mg/l except pH)	Number of analyses in range
Iron	0.3	100	0.2 - 2250	10
Chloride	6.0	192	0.5 - 231	9
Nitrate	0.1	3.0	0.1 - 3.0	9

Constituent or property	Sample collected 3-16-67 (mg/l except pH)	Sample collected 4-27-70 (mg/l except pH)	Range in values during period covered (mg/l except pH)	Number of analyses in range
Total Solids	248	3316	208 - 7058	9
Hardness as $CaCO_3$	106	—	106 - 2310	9
pH	7.1	5.3	3.7 - 7.9	9

Groundwater samples were collected by the Water Resources Administration during the five years that the Hoffman Site was an active facility. The results of chemical analysis showed no evidence of contaminants moving from the landfill and into the groundwater observation wells. The report noted that some samples revealed elevated levels of heavy metals in the groundwater. The report further noted that this occurrence may be natural since the coal in the area of the Hoffman landfill is reported to contain high levels of heavy metals. In addition, a boron tracer was placed in the landfill to isolate contaminant specific to the activities at Hoffman. No boron was detected in the groundwater samples.[1]

The groundwater samples were also analyzed for pesticides and herbicides. The results detected sulfur, but sulfur is again normally detected in coals of that region.[1]

Finally, in June of 1992, MDE/Site Assessment Division conducted a Level III Site Inspection at the Hoffman landfill. This inspection included the collection of samples from an on-site monitoring well, nearby residences, and nearby surface water and sediment. The primary concern as a result of this sampling was the presence of elevated levels of heavy metals in the surface water sample collected from Braddock Run.[6]

3.0 Sample Collection Proposal

Samples are proposed for collection from the groundwater, surface water, sediment, and soil in the vicinity of the site. These samples will be collected and submitted for analysis in accordance with the USEPA Contract Laboratory Program (CLP) Routine Analytical Services (RAS). The samples will be analyzed for a full scan of all priority pollutants, which includes analyses for both organic and inorganic compounds.

The samples will be collected in four sample matrices: one organic aqueous, one organic solid, one inorganic aqueous, and one inorganic solid.

CLP protocol will be followed throughout the sample collection and submittal process (U.S. "User's Guide to CLP,"

Dec. 1988). The Quality Control (QC) used by MDE includes the submittal of a field duplicate for each matrix as defined above. Note that a maximum of twenty samples are permitted per matrix.

In addition, each matrix will also have one sample designated as the spike sample, which will be collected at specified additional volumes in order to provide the laboratories with additional sample volumes for CLP matrix spike QC procedures. Specifically, the following additional volumes including both the spike volume and the corresponding spike duplicated volume, will be collected (volumes expressed as multiples of the regular sample volume of 1):

Sample Matrix	Spike Volume
Organic Aqueous	3
Organic Solid	2
Inorganic Aqueous	2
Inorganic Solid	1

Finally, a field blank will be provided for the aqueous matrices. This field blank will consist of deionized water provided by the Maryland Department of Health and Mental Hygiene (MDHMH) Laboratory. This water will be transported to the field in 5-gallon containers, and the water will be transferred (in the field on the day of the sampling collection) to the appropriate sample containers. Should more than one day be required for sample collection, then samples will be shipped daily to the appropriate labs. Aqueous volatile organics analysis (VOA) trip-blank sample will be included with each day's organic shipment after the first day, which will include the field blank mentioned above. The trip-blank consists of deionized water, fixed with HCL and contained in VOA sample containers.

3.1 Source Samples

When the landfill was closed it was covered with 3-5 feet of cover material. As a result, it is necessary to bore deeper than 5 feet in an effort to characterize the materials which were disposed into the Hoffman landfill.

It is recommended that four source samples be collected in the area of the Hoffman landfill. These samples will be collected at a depth of between 5-10 feet. One mechanism which may be used to collect these samples would be an auger and thin wall sampler. These source samples will be labeled Source 1-4.

In addition, a background sample collected at the same depth will also be collected and labeled as Source 5.

3.2 Groundwater Sampling

During the 1992, Level III Site Inspection conducted by MDE/Site Assessment, groundwater samples were collected from the following sources:

1) The Clarysville System: A spring which serves 28 persons
2) 2 residential wells (1 target sample and 1 background sample)
3) The Maple Hurst golf course well used to fill ponds
4) an on-site monitoring well

Vinyl chloride was detected in the on-site monitoring well at 2 ppb. In addition, chloroform was detected in the target residential well sample at a concentration of 4 ppb. The owners of the property indicated that the well had been deepened and that they were treating it with chlorine. According to publications on chloroform, "chlorinated drinking water," is a cause of chloroform detected in groundwater. Based on this, it was determined that the low chloroform levels detected were related to the chlorine treatment occurring.

Barium was found at a concentration greater than three times background, in the target residential well sampled. This value was well below the MCL for barium, and was not considered either attributable to the Hoffman landfill, or a health threat.

Since the CLP sampling of the on-site monitoring well detected vinyl chloride, MDE requests permission to sample 4 residential wells surrounding the Hoffman site in the interest of public health and safety. MDE will attempt to make one of these wells, RW-1 the same location as the GW-2/SW-5 sampling location during the Level III Site Inspection. The remaining locations will be determined.

3.3 Surface Water and Sediment Samples

The primary target of concern for the Hoffman landfill is Braddock Run which is considered to be a fishery. During the sampling conducted by MDE in June of 1992, elevated levels of metals were detected along Braddock Run near Clarysville.[6] In order to characterize the runoff in this area and to attribute compounds detected to specific locations, the following samples are recommended.

First, the on-site pond will be sampled and designated SW-1/Sed-1. It is believed that much of the run off from the site flows toward this pond. As a result, this would give an indication of surface water contamiantion as a result of overland flow. This pond is not considered a fishery, and as a result, would have limited targets associated with it.

Underground drainage is diverted from the deep mines underlaying Hoffman landfill and into the Hoffman Drainage Tunnel. Drainage entering this tunnel is then discharged into Braddock Run. The Hoffman drainage tunnel was completed in 1906 and appears to extend approximately 2 miles south of the Hoffman landfill. It is believed that the Hoffman Drainage Tunnel acts to discharge much of the underground drainage in the area. The fact that this tunnel receives and directs discharge from a relatively large radial area presents a problem with attributing heavy metal contamiantion to one single source.

In an attempt to best characterize the source of contamiantion, MDE recommends the following samples be collected along Braddock Run. First a background sample along Braddock Run labeled SW-2/Sed-2. Next, it is recommended that SW-3/Sed-3 be collected along the Hoffman Drainage Tunnel. This would be the first point where underground drainage from the site enters the surface water pathway. SW-4/Sed-4 will be collected at the point where the Hoffman drainage tunnel merges with Braddock Run.

Allegany County, was an area of extensive strip mining in the early 1900's. In an effort to isolate the Hoffman Drainage Tunnel as the source, MDE recommends liberal sampling of the southern section of Braddock Run. Approximately 1600 feet downstream of SW-4/Sed-4 MDE recommends that SW-5/Sed-5 be collected.

Further downstream, Braddock Run merges with a small unnamed stream originated in Eckhardt Mines. MDE will collect SW-6/Sed-6 as a background sample, upgraident along the unnamed stream. In addition, SW-7/Sed-7 will be collected near Clarysville, at the point where the unnamed stream and Braddock Run merge.

Finally, SW-8/Sed-8 will be collected downstream of SW-7/Sed-7 to determine if any contamination from the landfill is migrating. Since the stream in the portion of Braddock Run east of Clarysville is wider and deeper this is the area where fishing is most likely to occur.

MDE is aware that some of the proposed sampling locations are similar, if not identical to those sampled in June, 1992. This duplication is recommended since for this sampling activity, MDE is expanding the scope of the sample analysis to include boron which was a tracer seeded into the landfill.

3.4 Soil Samples

In the June, 1992 sampling conducted by MDE low levels of pesticides and polycyclic aromatic hydrocarbons were detected in the on-site surface soil. In addition, low levels of mercury and cyanide were detected on-site as well. The concentrations of inorganics detected are not near levels of health concern. Since

this sampling detected no hazards in the surface soil, it is recommended that no further samples be collected.

3.5 Special Analytical Services (SAS) Samples

In addition to the sample analysis routinely conducted under Routine Analytical Services (RAS), Special Analytical Services (SAS) analysis also will be completed. Specifically, analysis of the tracer element boron has be added. As discussed above, boron was placed into the landfill to serve as a tracer element. The procedures used to set up the SAS request will follow those outlined in "User's Guide to the Contract Laboratory Program" published by EPA in January of 1991.

4.0 Sample Summary Table

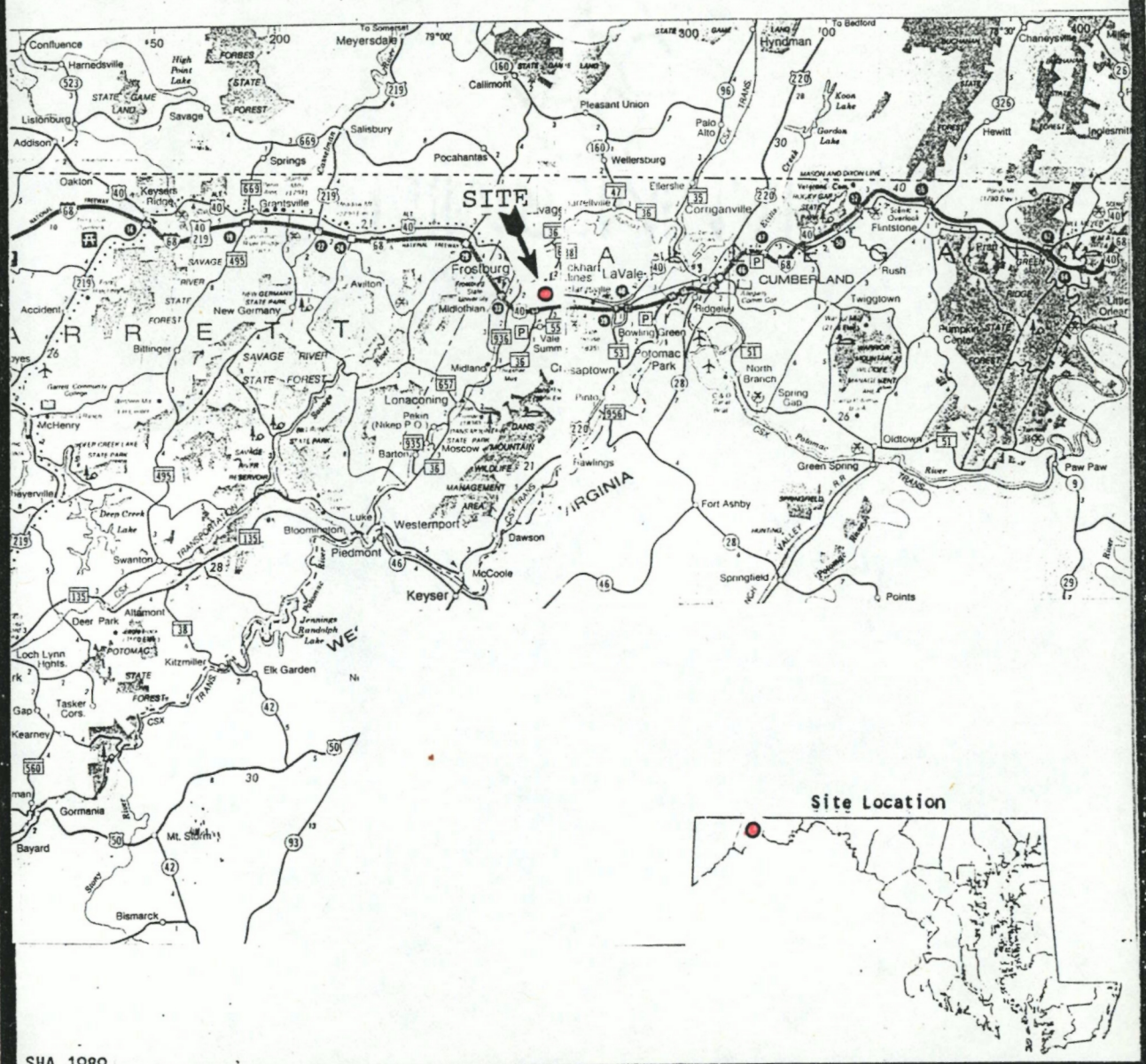
Sample Designation	Sample Type	Sample Location	Rationale
Source 1	soil	on-site soil at a depth of between 5-10 feet.	determine contamiantion attributable to landfilling at the Hoffman site
Source 2	soil	see Source 1	See Source 1
Source 3	soil	see Source 1	see Source 1
Source 4	soil	see Source 1	see Source 1
Source 5	soil	off-site at a depth of 5-10 feet	background
RW-1	aqueous	Level III SIP sample designated GW-2/GW-5	public health and safety
RW-2	aqueous	see RW-1	public health and safety
RW-3	aqueous	see RW-1	public health and safety
RW-4	aqueous	to be determined	background
SW-1	aqueous	on-site pond	determine contaminants which have the potential to affect the surface water pathway via overland flow
Sed-1	sediment	on-site pond	see SW-1
SW-2	aqueous	southern portion of Braddock Run	background sample
Sed-2	sediment	see SW-2	see SW-2
SW-3	aqueous	Probable point of entry. This is the point where underground drainage from the area enters the perennial surface water body.	determine compounds that the Hoffman Drainage Tunnel may be introducing.
Sed-3	sediment	see SW-3	see SW-3

Sample Designation	Sample Type	Sample Location	Rationale
SW-4	aqueous	point where the Hoffman Drainage Tunnel merges with Braddock Run.	determine contamination that the Hoffman Drainage Tunnel may be introducing to Braddock Run.
Sed-4	sediment	see SW-4	see SW-4
SW-5	aqueous	approximately 1900 feet downstream along Braddock Run	Determine the path and concentration of compounds in Braddock Run
Sed-5	sediment	see SW-5	see SW-5
SW-6	aqueous	upstream sample along northern portion of Braddock Run near Eckhardt Mines	background
Sed-6	sediment	see SW-6	see SW-6
SW-7	aqueous	point of confluence of norther and southern portion of Braddock Run	Isolate contaminants which may affect the fishery along this section of Braddock Run, and those which may affect wetlands.
Sed-7	sediment	see SW-7	see SW-7
SW-8	aqueous	downstream along Braddock Run	determine contamination of a fishery
Sed-8	sediment	see SW-8	see SW-8

5.0 Figures

Regional Highway Map

Figure 1



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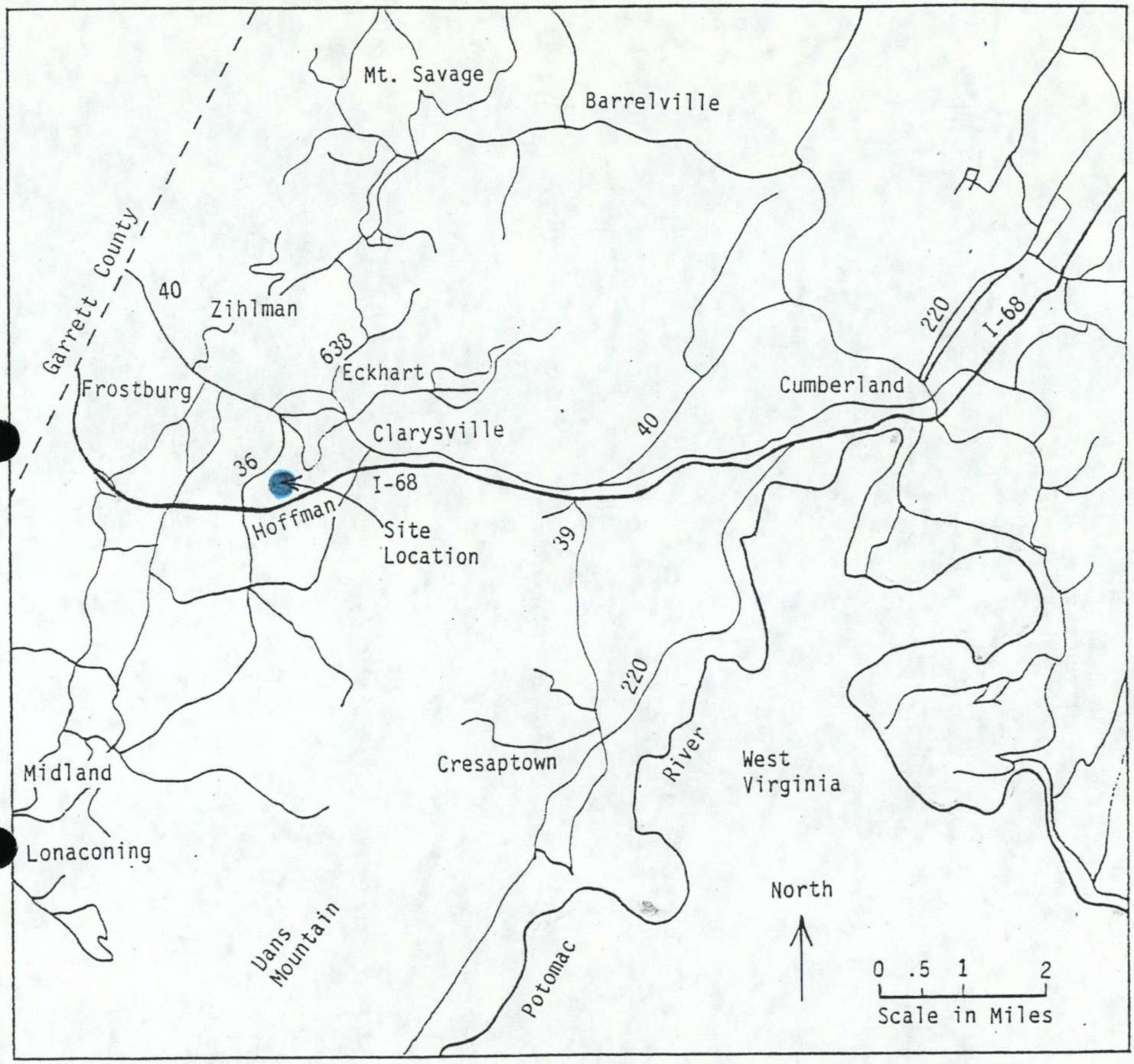
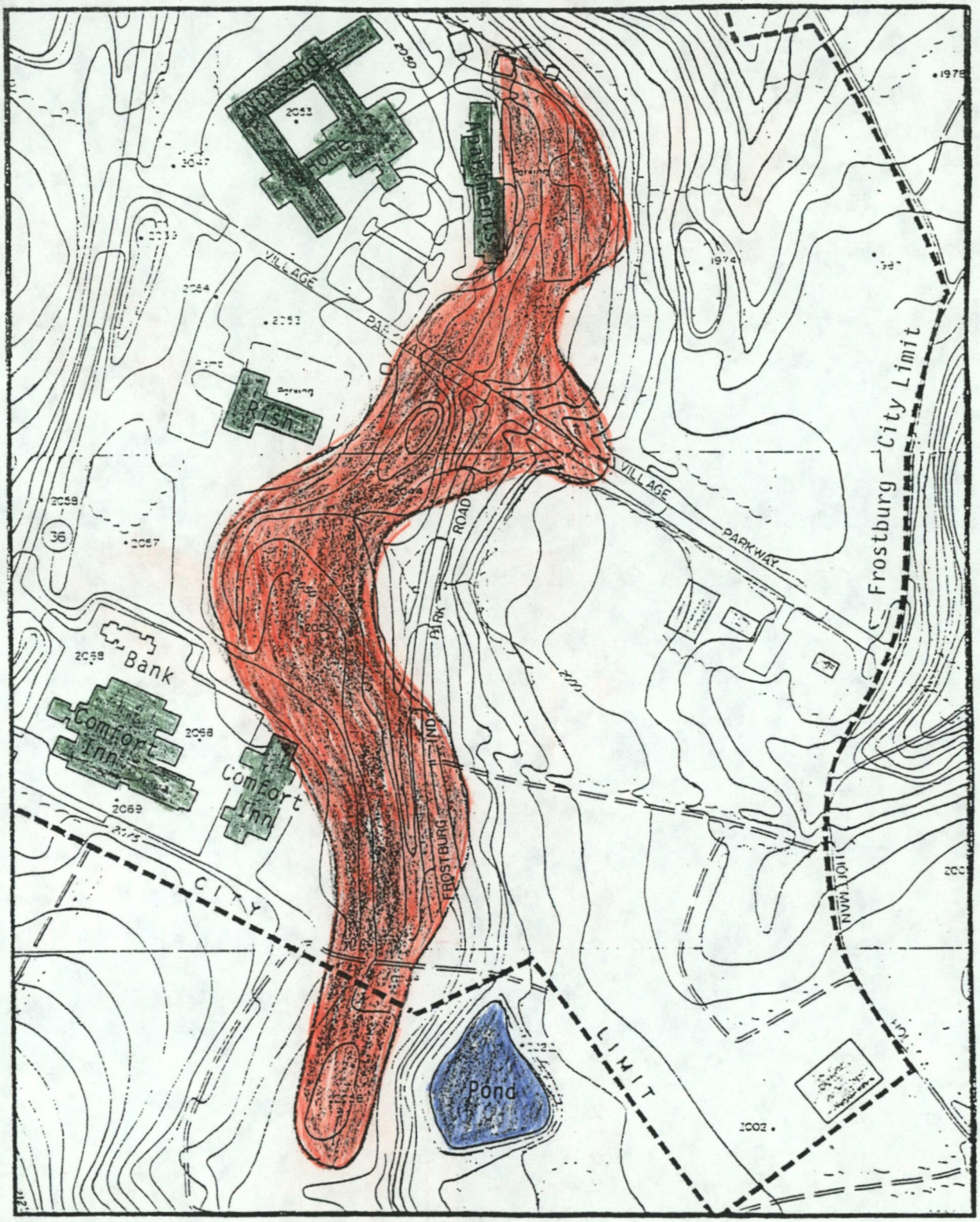


Figure 2 - Index Map of western Allegany County, Maryland, showing towns, roads, and location of the Hoffman Landfill.



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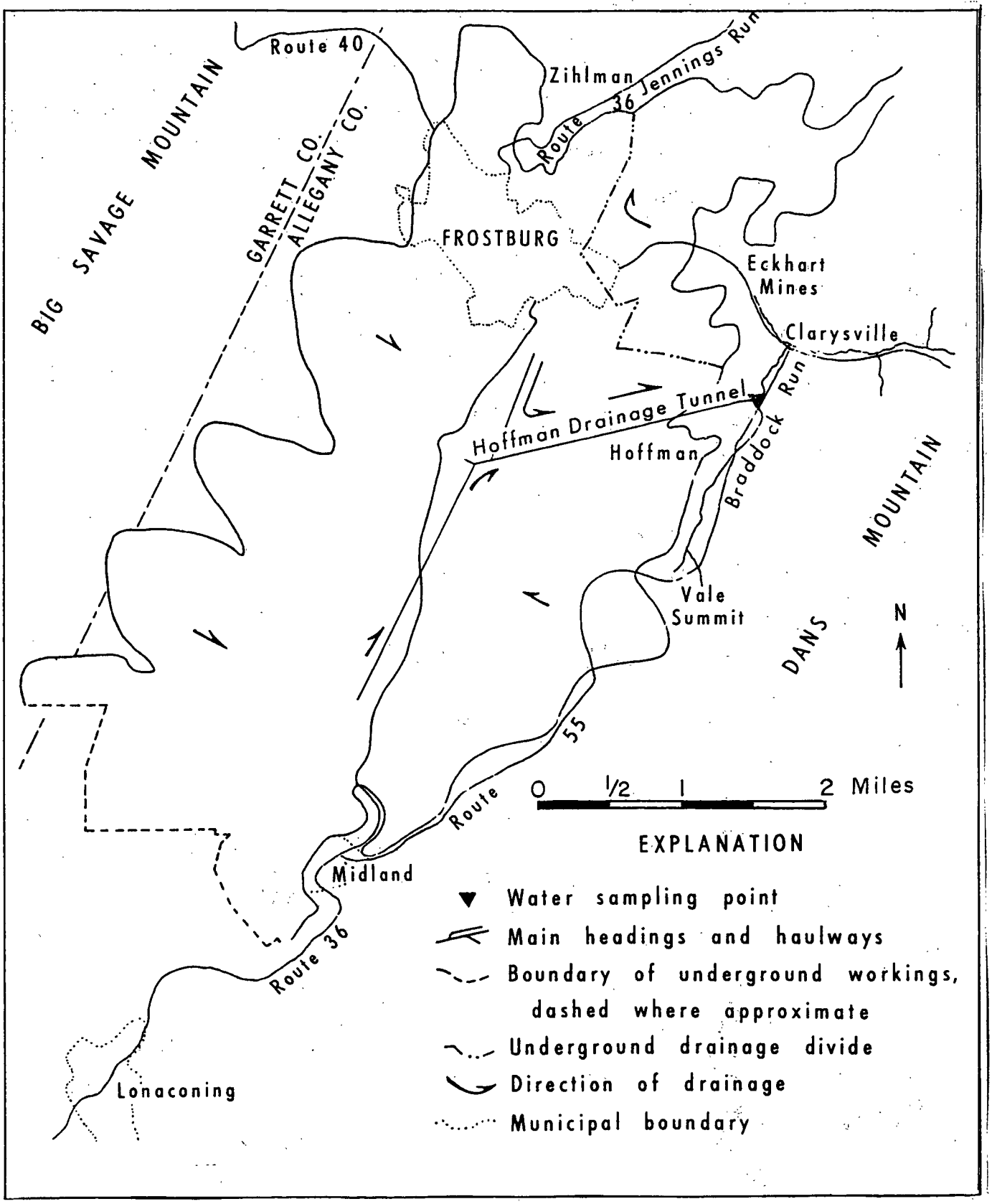
Scale

North

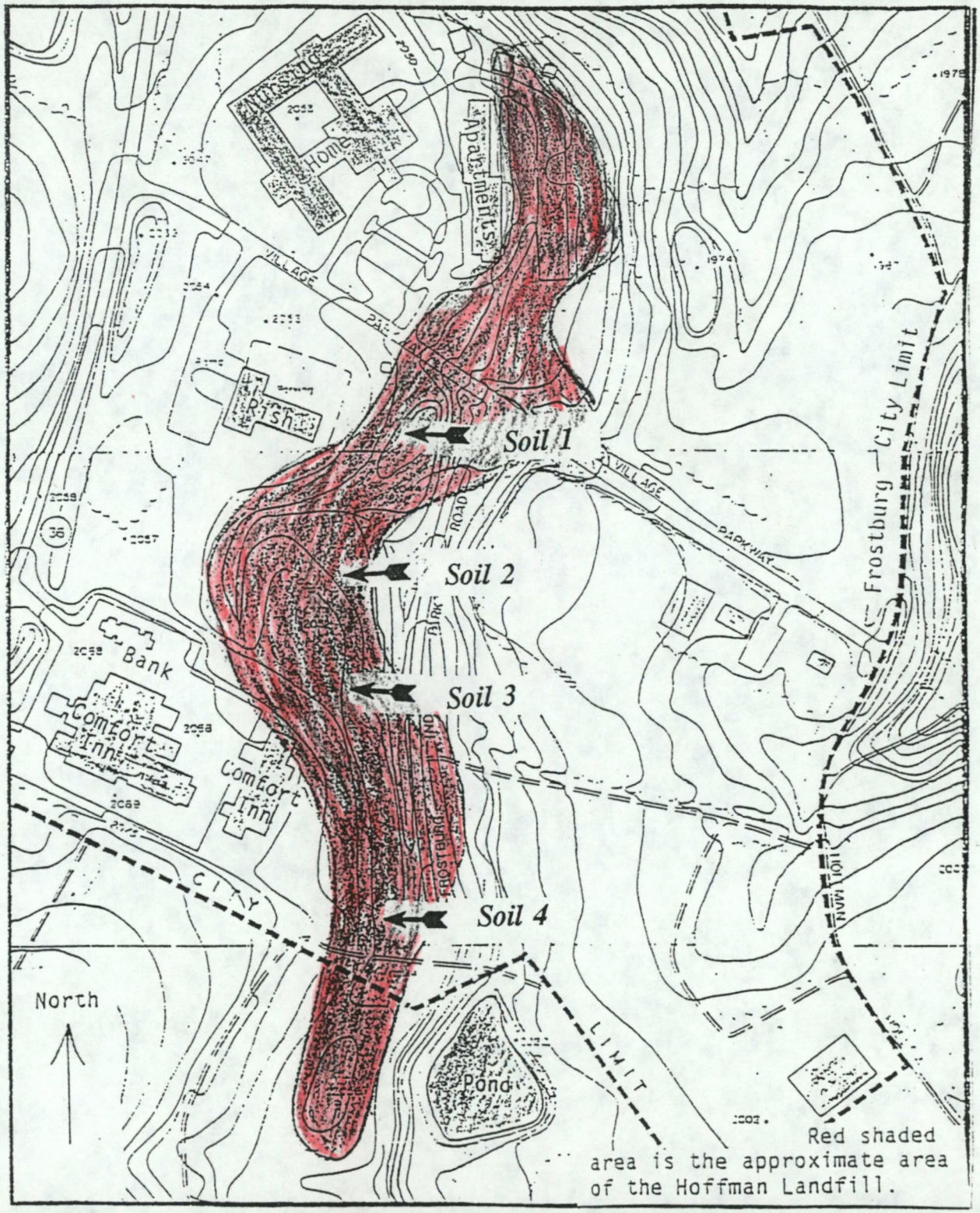
Figure 3 - Map showing the locations of buildings in the Frostburg Industrial Park. Red shaded area is the approximate area of the Hoffman Landfill.

Figure 4: Map of the Location and Extent of Underground Mine Workings Showing Inferred Direction of Water Flow



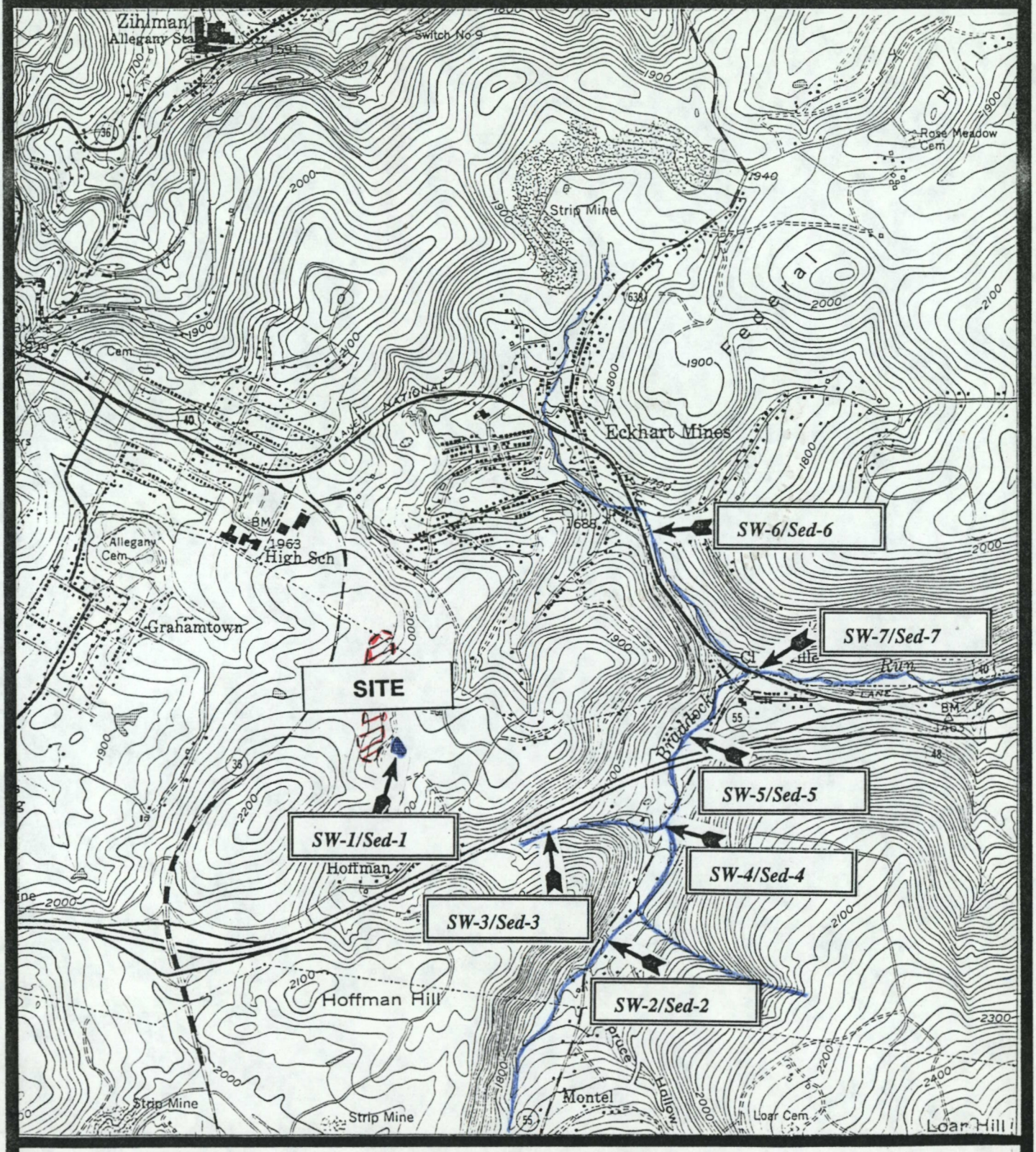
Reference: 2

Proposed Location for On-site Source Samples **Figure 5**



Proposed Location of Surface Water and Sediment Samples

Figure 6



6.0 Investigation-Derived Waste Plan

The only projected waste would be soil cutting from the auger and thin wall sampler. During the collection of the source samples, cutting from the bore holes will be temporarily contained on neoprene. After the sample has been collected, the contained soil will be placed back into the bore hole that it was removed from.

Decon fluid will be disposed on site.

7.0 Project Management

Project Manager:	Jennifer Pearson and Ginny Sells
Safety Officer:	Chris Pajak
CLP QC:	Michele Mosco
Site Geologist:	Robert Rothman

In addition, it is expected that two additional persons will be used as samplers.

This sample exercise is expected to be completed within one day.

8.0 References

1. Maryland Department of Health and Mental Hygiene. Use of Abandoned Strip Mines for Disposal of Solid Waste In Maryland. June, 1973.

2. Hollyday, E.F., S.W. McKenzie. Hydrogeology of the Formation and Neutralization of Acid Water Draining from Underground Coal Mines of Western Maryland. Maryland Geological Survey--Report of Investigation No. 20. 1973.

3. Otton, Edmond G. Solid-Waste Disposal in the Geohydrologic Environment of Maryland. Maryland Geological Survey--Report of Investigation No. 18. 1972.

4. Maryland Department of the Environment/Waste Management Administration. Level III Site Inspection. Finalized December, 1992.

5. U.S. Environmental Protection Agency. On-Site Inspection of Hoffman Landfill. F3-8009-06. Ecology and Environment Field Investigation Team.

6. MDE/Site Assessment. Level III Site Inspection. December, 1992.

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Appendix A

Concentrations Detected from the Hoffman Drainage Tunnel

Major Constituents in Coal Mine Drainage		
Compound	Date of Collection	Concentration Detected (mg/l)
Silica	8-27-70	13
Aluminum	8-27-70	0
Iron	8-27-70	12
Manganese	8-27-70	3.7
Sodium	8-27-70	4.8
Potassium	8-27-70	1.8
Copper	8-27-70	0
Zinc	8-27-70	0.17
Sulfate	8-27-70	579
Minor Constituents in Coal Mine Drainage		
Compound	Date of Collection	Detected Concentration (µg/l)
Aluminum	August 27, 1970	500
Antimony	August 27, 1970	< 23
Arsenic	August 27, 1970	10
Barium	August 27, 1970	13
Beryllium	August 27, 1970	< 1
Boron	August 27, 1970	14
Cadmium	August 27, 1970	3
Chromium	August 27, 1970	3
Cobalt	August 27, 1970	70
Copper	August 27, 1970	< 1
Lead	August 27, 1970	< 5
Manganese	August 27, 1970	4,000
Mercury	August 27, 1970	--
Nickel	August 27, 1970	190

Selenium	August 27, 1970	0
Silver	August 27, 1970	< 0.4
Vanadium	August 27, 1970	< 5
Zinc	August 27, 1970	1,000

Appendix B

New Jersey Department of Health

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **CARBON BLACK**

CAS Number: 1333-86-4
DOT Number: UN 1361

RTK Substance number: 0342
Date: Jan. 1986 Revision: Aug. 1992

HAZARD SUMMARY

* Carbon Black can affect you when breathed in.
* Overexposure can cause cough with phlegm.
* Repeated exposure may scar the lungs and reduce lung function, with possible shortness of breath. These changes usually develop slowly over many years.
* Carbon Black may be contaminated with *Polycyclic Aromatic Hydrocarbons* (PAH's). PAH's have been shown to cause cancer. *CONSULT THE NEW JERSEY DEPARTMENT OF HEALTH HAZARDOUS SUBSTANCE FACT SHEET ON BENZO(a)PYRENE* for further information on PAH's and ask your employer about PAH contamination.

IDENTIFICATION

Carbon Black is a black, odorless solid (powder, pellets or paste). It is used in making tire treads, in abrasion resistant rubber products, and as a pigment for paints and inks.

REASON FOR CITATION

* Carbon Black is on the Hazardous Substance List because it is regulated by OSHA and cited by NIOSH, ACGIH, DOT and IARC.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) is 3.5 mg/m^3 averaged over an 8-hour workshift. (Final Rule, January 1989).

NIOSH: The recommended airborne exposure limit is 3.5 mg/m^3, or 0.1 mg/m^3 if it contains PAH's, averaged over a 10-hour workshift.

ACGIH: The recommended airborne exposure limit is 3.5 mg/m^3 averaged over an 8-hour workshift.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to Carbon Black and at the end of the workshift.
* If Carbon Black contains more than 0.1% PAH's, it should be used, handled and stored in a regulated area in the same manner as a carcinogen.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Carbon Black to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to Carbon Black:

* Overexposure can cause cough with phlegm. This usually clears up after exposure is properly controlled, but if such exposures are repeated over many months or years, long lasting lung effects may occur.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to Carbon Black and can last for months or years:

Cancer Hazard

* Carbon Black may contain several substances which are known carcinogens (such as *Benzo(a)pyrene*). Whether or not it poses a cancer hazard needs further study. It should be handled with caution.

Reproductive Hazard

* According to the information presently available to the New Jersey Department of Health, Carbon Black has not been tested for its ability to affect reproduction.

Other Long-Term Effects

* Repeated exposure may cause lung scarring, visible on chest x-ray, and/or some loss of lung function, with shortness of breath. These changes usually develop slowly over a period of many years, and are not curable.
* If Carbon Black is contaminated with PAH's, skin rashes and other skin changes, including growths, can occur.

MEDICAL

Medical Testing

For those with frequent or potentially high exposure (half the TLV or greater), the following are recommended before beginning work and at regular times after that:

* Chest x-ray (to be read by a special NIOSH "B reader" radiologist).
* Lung function tests.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures

Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Where possible, automatically transfer Carbon Black from drums or other storage containers to process containers.
* Specific engineering controls are recommended for this chemical by NIOSH. Refer to the NIOSH' criteria document: *Occupational Exposure to Carbon Black #78-204.*

Good WORK PRACTICES can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by Carbon Black should change into clean clothing promptly.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Carbon Black.
* On skin contact with Carbon Black, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted Carbon Black, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where Carbon Black is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.
* Do not dry sweep for clean-up. Use a vacuum or a wet method to reduce dust during clean-up.
* If Carbon Black contains more than 0.1% PAH's it should be handled with caution as a CARCINOGEN.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with Carbon Black. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

* Wear dust-proof goggles when working with powders or dust, unless full facepiece respiratory protection is worn.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* Where the potential exists for exposures over 3.5 mg/m^3, use a MSHA/NIOSH approved respirator equipped with particulate (dust/fume/mist) filters. More protection is provided by a full facepiece respirator than by a half-mask respirator, and even greater protection is provided by a powered-air purifying respirator. Particulate filters must be checked every day before work for physical damage, such as rips or tears, and replaced as needed.
* If while wearing a filter, cartridge or canister respirator, you can smell, taste, or otherwise detect Carbon Black, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter, cartridge, or canister. If the seal is no longer good, you may need a new respirator.
* Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters, cartridges, or canisters, to protect against different forms of a chemical (such as

vapor and mist) or against a mixture of chemicals.

* Where the potential for high exposures to Carbon Black exists, or if it contains greater than 0.1% PAH's, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pres sure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include <u>dust releasing operations</u> (grinding, mixing, blasting, dumping, etc.), <u>other physical and mechanical processes</u> (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and <u>"confined space" exposures</u> (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

The New Jersey State Department of Health, Occupational Health Service offers multiple services in occupational health. These include: Right to Know Information Resources, Public Presentations, General References, Industrial Hygiene Information, Surveys and Investigations, and Medical Evaluation. Consult another Fact Sheet for a more detailed description of these services or call (609) 984-1863.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEPE is the New Jersey Department of Environmental Protection and Energy.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

>>>>>>>>>>>>>>>>>> E M E R G E N C Y I N F O R M A T I O N <<<<<<<<<<<<<<<<<

Common Name: **CARBON BLACK**
DOT Number: UN 1361
DOT Emergency Guide code: 32
CAS Number: 1333-86-4

Hazard rating	NJ DOH	NFPA
FLAMMABILITY	Not Found	Not Rated
REACTIVITY	Not Found	Not Rated
POISONOUS GASES ARE PRODUCED IN FIRE		
COMBUSTIBLE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Carbon Black is a COMBUSTIBLE SOLID.
* POISONOUS GASES ARE PRODUCED IN FIRE.
* Use sand or dry chemical, water spray or foam extinguishers.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If Carbon Black is spilled, take the following steps:

* Restrict persons not wearing protective equipment from area of spill until clean-up is complete.
* Remove all ignition sources.
* Collect powdered material in the most convenient and safe manner and deposit in sealed containers.
  It may be necessary to contain and dispose of Carbon Black as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEPE HOTLINE: (609) 292-7172

HANDLING AND STORAGE

* Prior to working with Carbon Black you should be trained on its proper handling and storage.
* Carbon Black is not compatible with OXIDIZERS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES and NITRATES).
* Sources of ignition, such as smoking and open flames, are prohibited where Carbon Black is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
* If Carbon Black contains more than 0.1% PAH's, it should be used, handled and stored in a regulated area in the same manner as a carcinogen.

FIRST AID

In NJ, POISON INFORMATION 1-800-962-1253

Eye Contact
* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact
* If PAH contamination is present, wash skin promptly after skin contact.

Breathing
* Remove the person from exposure.
* Transfer promptly to a medical facility.

PHYSICAL DATA

Water Solubility: Insoluble

OTHER NAMES

C.I. Pigment Black 7; Channel Black; Lamp Black; Furnace Black

NEW JERSEY DEPARTMENT OF HEALTH
Right to Know Program
CN 368, Trenton, NJ 08625-0368
(609) 984-2202

Appendix C

SITE SAFETY PLAN

FOR

EXPANDED SITE INSPECTION
HOFFMAN LANDFILL
(MD-004)

STATE OF MARYLAND

DEPARTMENT OF THE ENVIRONMENT

WASTE MANAGEMENT ADMINISTRATION

(MDE/WAS)

CERCLA SITE ASSESSMENT DIVISION

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1.0 SITE DESCRIPTION

1.1 SITE NAME AND ADDRESS:

Hoffman Landfill
Frostburg Industrial Park, Route 36
Frostburg, Maryland
21532

1.2 SITE NUMBER: MD-004

1.3 DATES PLANNED ON-SITE: Week Ending November 5, 1993

1.4 CHEMICAL HAZARDS PRESENT OR SUSPECTED:

Vinyl Chloride - In Groundwater
Beryllium - In Groundwater
Barium
Lead - In Surface Water
Arsenic, Beryllium, Cobalt, Manganese, and Nickel found in surface water and sediment samples.

Fluoranthene and Mercury - In Soil

1.5 TOTAL AREA OF SITE: 22 Acres

1.6 AREA BEING STUDIED: Site proper and associated pathways.

1.7 SURROUNDING POPULATION:

On-Site:	0
0 - 1/4 Mile:	290
1/4 - 1/2 Mile:	68
1/2 - 1 Mile:	1112

1.8 TOPOGRAPHY OF SITE:

Hilly to Mountainous terrain

1.9 WEATHER CONDITIONS AND FORECAST:

TBA prior to sampling event

1.10 SITE ACCESS MAPS:

Regional Map: Refer to figure 1 of sampling plan

Street Map: Refer to figure 2 of sampling plan

2.0 ENTRY OBJECTIVES

The purpose(s) of this site entry are:

X — to identify the suspected contamination of (air, soil, groundwater, surface water) in vicinity of the site.

X — to determine the degree of contamination of (air, soil, groundwater, surface water) in vicinity of the site.

X — to evaluate and score site.

____ _____

____ _____

____ _____

____ _____

____ _____

____ _____

____ _____

The following number of samples will be collected:

5 Soil Samples (5-10 ft. depth)

____ Soil Gas Samples

____ On-site Well Water Samples

____ Production Well Water Samples

____ Monitoring Well Water Samples

4 Residential Well Water Samples in the Vicinity

7 Surface Water Samples

7 Sediment Samples

____ Air Samples

____ Container Samples

____ Leachate

3.0 ON-SITE ORGANIZATION AND COORDINATION

3.1 MDE-WAS CERCLA PRE-REMEDIAL DIVISION REPS:

Contact: Alex M. Cox, Division Chief
2500 Broening Highway
Baltimore, Maryland 21224
410-631-3493

The following personnel are designated to carry out the stated job functions on-site. One person may carry out more than one job function. In case of absence of personnel, the alternative will be designated by the Project Manager and/or authorized personnel.

JOB FUNCTION	NAME	WORK PHONE
Project Manager	Jennifer Pearson	631-3455
Site Safety Officer	Chris Pajak	631-3449
Field Quality Assurance Officer	Michele Mosco	631-3465
Site Geologist	Bob Rothman	631-3448
Sampling Team	TBD	
Drilling Team	N/A	

3.2 OTHER STATE REPS:

AGENCY	NAME	PHONE
None		

3.3 FEDERAL AGENCY REPS:

None		

3.4 LOCAL AGENCY REPS:

None		

3.5 OTHER REPS:

None		

4.0 ON-SITE WORK PLAN

The following on-site tasks will be performed by the designated personnel: **TBD**

TASK	TEAM MEMBERS
Decontamination Zone Setup	
Decontamination Team	
Grid System Setup	
On-Site Well Sampling	
Soil Sampling	
Soil Gas Survey	
Well Sampling	
Surface Water/Sediment	
Air Sampling	
Rescue Team	
Field GC Sampling Team	

Water Level Measuring/Well Purging

5.0 SITE CONTROL - WORK ZONES

The following personnel have been designated to coordinate access control and security on-site:

Chris Pajak / Jennifer Pearson

In order to prevent or reduce the migration of contaminants, controlled work zones and control points should be set up and marked. Work zones include the Exclusion Zone (hot zone), Contamination Reduction Zone (decon zone), and Support Zone (clean zone). No unauthorized person should be within these areas. Command Post (support zone) should be located upwind from the Exclusion Zone. The control boundaries and access control points into each zone will be marked and made known to all personnel during daily briefing. The work zone is sketched below:

Sampling events at the Hoffman Landfill Site will be initiated in level "D" protective wear. The work zones as indicated above are not applicable for this phase of work to be completed.

6.0 SAFETY AND SPECIAL TRAINING REQUIRED

All personnel permitted in areas requiring personnel protective equipment and clothing (the hot zone and decontamination zone) must have, as a minimum requirement, attended EPA's Personnel Protection and Safety training course (165-2) or equivalent (165-5). A safety and task briefing meeting will be conducted each day before site entry. The safety procedures, evacuation procedures, escape procedures, as well as the day's planned activities will be discussed.

7.0 HAZARD EVALUATION

7.1 PRIMARY HAZARDS

The following substance(s) are known or suspected to be on-site. The primary hazards of each are identified as:

SUBSTANCE	CONCENTRATION(if known)	HAZARD THROUGH

Refer to list of contaminants, page 1 of Site, Health and Safety Plan.

7.2 ADDITIONAL HAZARDS

The following additional hazards are expected on-site:

X	Slippery Ground
X	Uneven Terrain
X	Woods
X	Insects
X	Snakes
X	Steep Slopes
X	Cold Weather

* Some excavation, due to the installation of a new water line is being performed near the site. Samplers should be made aware of dug up areas (trenches) and heavy equipment activity.

7.3 HAZARDOUS SUBSTANCE INFORMATION FORM

Attachment A shows the hazardous substance information form(s) for the involved substance(s) obtained from MDE's Environmental Health Coordination Program.

8.0 PERSONNEL PROTECTION EQUIPMENT

8.1 TASK TEAM PROTECTION LEVEL

Based on evaluation of potential hazards, the following levels of personnel protection have been designated for each task team:

TASK TEAM	PROTECTION LEVEL (A,B,C,D, OTHER)
Decontamination Zone Setup	D
Grid System Setup	N/A
Well Sampling	D
Soil Gas Survey	N/A
Soil Sampling	D
Surface Water Sediment Sampling	D
Residential Well Sampling	D
Air Sampling	N/A
Container Sampling	N/A
Rescue Team	N/A
Decontamination Team	D
Drilling Team	N/A
Soil Boring Sampling/GC Analysis	N/A
Split Spoon Soil Sampling	N/A

8.2 SPECIFIC PROTECTIVE EQUIPMENT

Specific protective equipment for each protection level:

LEVEL A

Fully encapsulating chemical-resistant suit
Pressure-demand, self-contained breathing apparatus (SCBA)
Coveralls*
Long cotton underwear*
Gloves(inner), chemical resistant
Boots, chemical-resistant, steel toe and shank
Hard hat (under suit)*

Disposable gloves and boot covers* (worn over fully encapsulating suit)
Cooling unit*
2-way radio communications (inherently safe)
(*) OPTIONAL

LEVEL B

Pressure-demand, self-contained breathing apparatus (SCBA)
Chemical-resistant clothing (includes: overalls and long-sleeved jacket; hooded, one or two-piece chemical splash suit; disposable chemical-resistant, one-piece suits)
Long cotton underwear*
Coveralls*
Gloves (outer), chemical-resistant
Gloves (inner), chemical-resistant
Boots, chemical-resistant, steel toe and shank
Disposable boot covers, chemical-resistant*
Hard hat (face shield)*
2-way radio communications (inherently safe)*
(*) OPTIONAL

LEVEL C

Air-purifying respirator, full-face, canister-equipped
Chemical-resistant clothing (includes: coveralls; hooded one or two-piece chemical-resistant coveralls)
Coveralls*
Long cotton underwear*
Gloves (outer), chemical-resistant
Gloves (inner), chemical-resistant
Boots, chemical-resistant, steel toe and shank
Disposable boot covers, chemical-resistant*
Hard hat (face shield)*
Escape mask*
2-way radio communications (inherently safe)*
(*) OPTIONAL

LEVEL D

Coveralls
Gloves*
Boots/Shoes, leather or chemical-resistant, steel toe and shank
Safety glasses or chemical-splash goggles*
Hard hat (face shield)*
Disposable boot covers*
Escape mask*
(*) OPTIONAL

OTHERS

Level B or Level C can be modified to fit the actual situation when necessary upon approval from Safety Officer. If air-purifying respirators are selected, the appropriate cartridge for use corresponding to the involved substances and concentrations will be designated as:

SUBSTANCE	CARTRIDGE

Modified Level D:

Respirator, organic/particulate cartridge

No changes to the specified levels of protection shall be made without the approval of the safety officer and the project manager.

9.0 MONITORING

9.1 ENVIRONMENTAL MONITORING

The following environmental monitoring instruments shall be used on-site (circle when applicable) at the specified intervals.

INSTRUMENT	FREQUENCY
Combustible Gas Indicator	continuous/hourly/daily/other_____
Oxygen Monitor	continuous/hourly/daily/other_____
Draeger Tubes	continuous/hourly/daily/other_____

INSTRUMENT	FREQUENCY
Metal Detector	continuous/hourly/daily/other_____
HNU/OVA Microtip	continuous/hourly/daily/other_____

*Microtip to be used on an as needed basis.

_____	_____
_____	_____
_____	_____

Radiation Detector Equipment:

Mini Alert Monitor 4	_____
Personal Radiation Monitor (Badges)	X
Count Rate Meter	Initial site entry/other_____
Geiger-Mueller Radiation	_____

9.2 HEAT STRESS MONITORING

For monitoring the body's recuperative ability to handle excess heat, one or more of the following techniques should be used as a screening technique. Monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. Frequency of monitoring

should increase as the ambient temperature increases or if slow recovery rates are indicated. When temperatures exceed 80 degrees Fahrenheit, workers must be monitored for heat stress after every work period.

- Heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be shortened by 33%.

- Body temperature should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the OT exceeds 99.7 degrees Fahrenheit at the beginning of the next rest period, the following work cycle should be further shortened by 33%. OT should be measured again at the end of the rest period to make sure that it has dropped below 99 degrees Fahrenheit.

- Body water loss (BWL) due to sweating should be measured by weighing the worker in the morning and in the evening. The clothing worn should be similar at both weighings; preferably the worker should be nude. The scale should be accurate to plus or minus 1/4 lb. BWL should not exceed 1.5% of the total body weight. If it does, workers should be instructed to increase their daily intake of fluids by the weight lost. Ideally, body fluids should be maintained at a constant level during the work day. This requires replacement of salt lost in sweat as well.

Good hygienic standards must be maintained by frequent change of clothing and daily showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

10.0 COMMUNICATION PROCEDURES

10.1 EMERGENCY SIGNAL - LEAVE HOT ZONE

The following signal is the emergency signal to indicate that all personnel should leave the Exclusion Zone:

N/A

Is a loud hailer required (YES/NO): NO

10.2 HAND SIGNALS

The following standard hand signals will be used in case of radio communication failure:

HAND SIGNALS	INDICATIONS
Hand gripping throat	Out of air, can't breathe
Pat on partner's shoulders	Leave area immediately
Both hands around waist	Leave area immediately
Grip partner's wrist	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	OK, I am alright, I understand
Thumbs down	No, negative

* Communication at the Hoffman Landfill site will be done primarily through verbal contact.

10.3 LOCATION OF TELEPHONE

The location of on-site phone: Car phone as available

The location of the nearest off-site phone (need to be mentioned during briefing): Off-site phone(s) located at Comfort Inn adjacent to the site.

11.0 DECONTAMINATION PROCEDURES:

Refer to Site Inspection Quality Assurance Project Plan.

12. EMERGENCY PLAN

12.1 EMERGENCY MEDICAL CARE FACILITY

Medical Facility: Frostburg Hospital

Address: 48 Tarn Terrace
Frostburg, MD.
21532

Phone Number: 301-689-1378

Time Needed to Reach Facility: 20 minutes driving time
Person Contacted: Administration

The person contacted has been briefed about the nature of site entry. The potential hazards and the substances involved. A map indicating the routes to this facility is shown to the personnel during briefing and is available at the designated place.

Designated place for medical facility access map: Sampling Van

Local ambulance available: Yes

Ambulance phone number: 911

Ambulance response time: Unknown

(Whenever possible, arrangements should be made for on-site standby.)

12.2 FIRST-AID EQUIPMENT ON-SITE

First-aid equipment is available on-site at the following locations:

First-Aid Kit: Sampling Van

Emergency Eye Wash: Sampling Van

:

:

12.3 EMERGENCY MEDICAL INFORMATION

Emergency medical information for substances present (from NIOSH Pocket Guide to Chemical Hazards):

SUBSTANCES	EXPOSURE SYMPTOMS	FIRST-AID INSTRUCTIONS

12.4 OTHER EMERGENCY PHONE LIST

List of Emergency Phone Numbers:

AGENCY/FACILITY	CONTACT	PHONE NUMBER
Police		911
Fire		911
Haz Mat Unit	MDE	333-2950
State Hazardous Material and Oil Response Unit	MDE	333-2950
Helicopter Ambulance		
Public Health Advisors (EHCP)		

13.0 EMERGENCY PROCEDURES

The following standard emergency procedures will be used by on-site staff who are also responsible for ensuring that the appropriate procedures are followed.

13.1 Personnel Injury in Hot Zone.

Designated emergency signal:_____

Upon notification of an injury in the exclusion zone, the designated emergency signal shall be sounded. All site personnel shall assemble at the decontamination line. The rescue team will enter the hot zone with proper level of protection to remove the injured person(s) to the decontamination zone. The Site Safety Officer and Project Manager should evaluate the nature of the injury, and the affected person(s) should be decontaminated to the extent possible prior to movement to the Support Zone. The Site Safety Officer shall initiate the appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall reenter the Exclusion Zone until the cause of the injury or symptoms are determined.

13.2 Personnel Injury in the Clean Zone.

Designated Emergency Signal:_____

Upon notification of an injury in the Support Zone, the Project Manager and Site Safety Officer will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the Site Safety Officer initiating the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk of others, the designated emergency signal shall be sounded and all site personnel shall move to the decontamination line for further instructions. Activities on-site will stop until the added risk is removed or minimized.

13.3 Fire or Explosion.

Designated Emergency Signal:_____

Upon notification of a fire or explosion on-site, the designated emergency signal shall be sounded and all site personnel assembled at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

13.4 Personal Protective Equipment Failure.

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

13.5 Other Equipment Failure.

If any other equipment on-site fails to operate properly, the Project Manager and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations on-site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions taken. Standby protective and monitoring equipment will be provided to ensure adequate protection in the event of equipment failure.

13.6 Alternate Escape Route from Hot Zone.

Figure X shows the designated emergency escape routes in the situations where egress from the Exclusion Zone cannot occur through the decontamination corridor.

13.7 Reentry after Emergency Evacuation.

In all situations, when an on-site emergency results in evacuating the Exclusion Zone, personnel shall not reenter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Site personnel have been briefed on any changes in the Site Safety Plan.

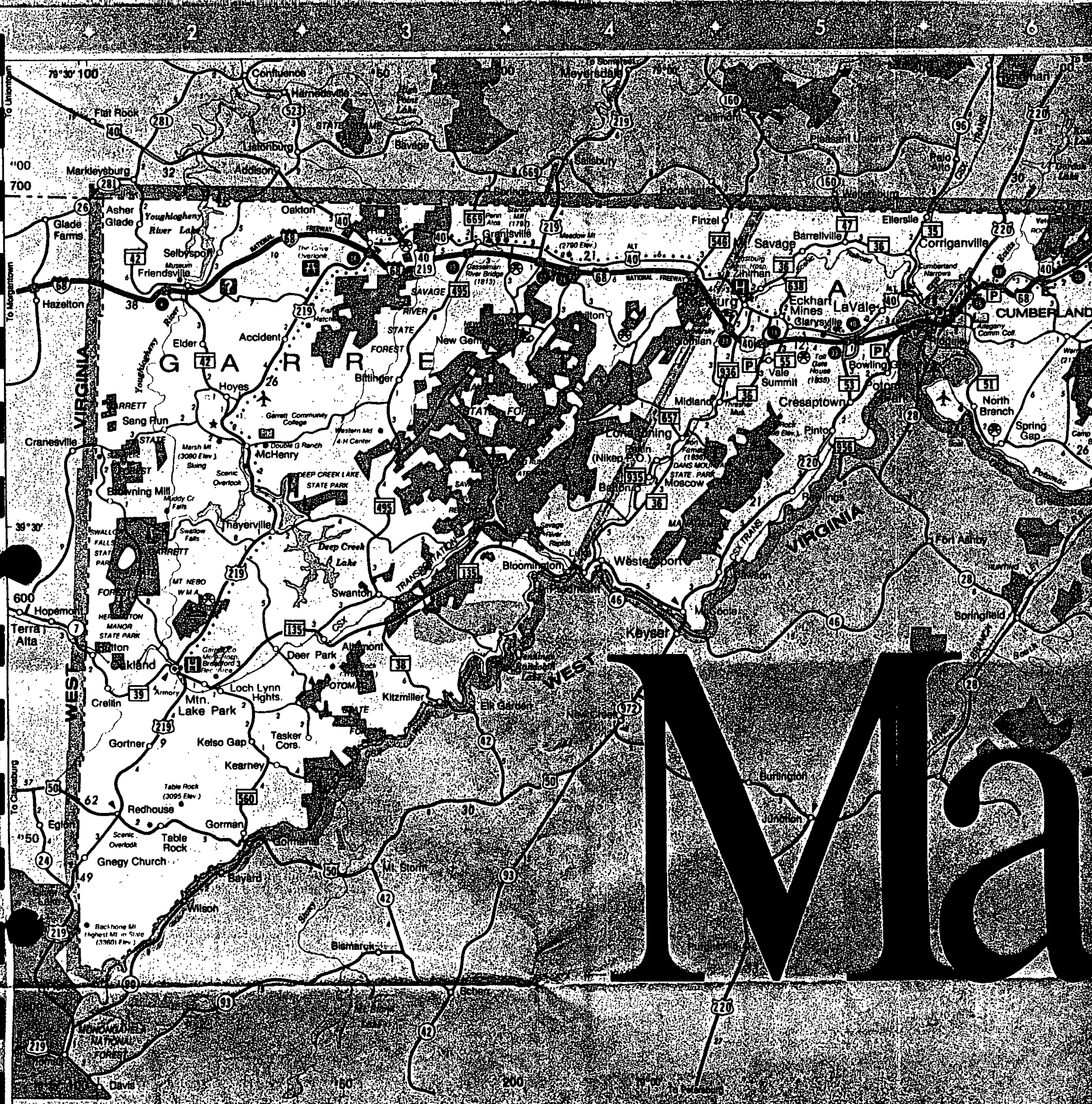
EMERGENCY PROCEDURES SUMMARY:

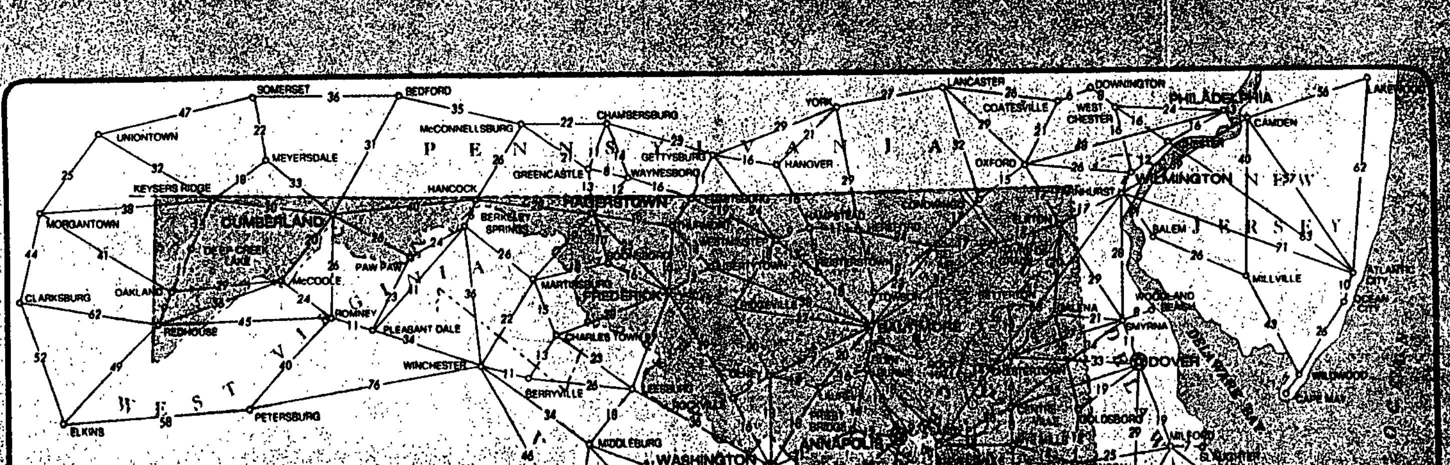
* Designated work zones are not applicable during this phase of the Site Inspection, therefore emergency signals other than those indicated in section 10.2 have not been established. The primary means of communication on site will be through verbal contact.

SAFETY PLAN ACKNOWLEDGEMENT FORM

All site personnel and site visitors have read the above plan and are familiar with its provisions.

NAME	AGENCY	SIGNATURE
Jennifer Pearson		
Bob Rothman		
Chris Pajak		
Michele Mosco		
Woody Featherstone		
Ginny Sells		
Ken Hannon		
Tom White		
John Ortiz		
Peggy Smith		
Vasile Rusu		
Sam Bellusci		
VISITORS		


Ma
GARRETT
Confluence
Meyersdale
Flat Rock
Markleysburg
Addison
Salisbury
Frostburg
Cumberland
LaVale
Corriganville
Grantsville
Oakton
Friendsville
Hazelton
Accident
McHenry
Deep Creek Lake
Thayerville
Swanton
Oakland
Mtn. Lake Park
Loch Lynn Hghts.
Deer Park
Kitzmiller
Redhouse
Gorman
Bayard
Keyser
Westernport
Bloomington
Cresaptown
North Branch
Spring Gap
Fort Ashby
Springfield
Burlington
Junction
Terra Alta
Hopemont
Crellin
Gortner
Kelso Gap
Kearney
Tasker Cors.
Gnegy Church
Table Rock
Mt. Storm
Bismarck
Davis
WEST VIRGINIA
VIRGINIA
MONONGAHELA NATIONAL FOREST
Youghiogheny River Lake
SAVAGE RIVER STATE FOREST
DEEP CREEK LAKE STATE PARK
Backbone Mt Highest Mt. in State (3360) Elev.)


SOMERSET
BEDFORD
UNIONTOWN
MEYERSDALE
McCONNELLSBURG
CHAMBERSBURG
GETTYSBURG
HANOVER
YORK
LANCASTER
COATESVILLE
WEST CHESTER
DOWNINGTON
PHILADELPHIA
CAMDEN
HANCOCK
HAGERSTOWN
CUMBERLAND
KEYSERS RIDGE
MORGANTOWN
OAKLAND
CLARKSBURG
REDHOUSE
ROMNEY
PLEASANT DALE
WINCHESTER
BERRYVILLE
FREDERICK
PETERSBURG
ELKINS
MIDDLEBURG
WASHINGTON
ANNAPOLIS
WILMINGTON
DOVER
SALEM
MILLVILLE
PENNSYLVANIA
NEW JERSEY
WEST VIRGINIA